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PATENT SPECIFICATION



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PROVISIONAL SPECIFICATION.

Improvements in and relating to Valves for Internal Combustion Engines.

We, FREDERICK SHIRLEY, of 63, Edgware Road, London, W. 2, a citizen of the United States of America, and JOHN WILLIAM GEORGE, of 5, Victoria Terrace, Tottenham Lane, in the County of London, subject of the King of Great Britain and Ireland, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to valves for internal combustion engines and has for its principal object to construct a rotary sleeve valve whose rotating member continually carries the supply of explosive
15 mixture for all the cylinders and also the means of exhaust through a centrally disposed chamber. Minor objects of the invention are to provide a construction of valve which is cheap to manufacture,
20 easy to construct and repair and readily applied to existing types of engine.

According to the present invention an outer casing is provided which is suitably waterjacketed and supplied with
25 means for lubricating an inner rotating member. An inlet port is also arranged in the outer casing to co-operate with especially shaped ports on the rotating member, giving a fan like induction
30 action to explosive mixture which is admitted through the inlet port to a chamber—hereinafter called the inlet chamber—situated in the rotating member. An interior chamber—hereinafter
35 called the exhaust chamber—is disposed centrally within the rotating member for conveying the exhaust gases of the working cylinders of the engine to the outlet pipe. Suitable inlet ports are

constructed in the rotating member to 40 allow the gas which is admitted through the inlet port in the outer casing to pass through the inlet chamber to the working cylinders of the engine at the correct intervals. Exhaust ports are also 45 carried on the rotating member and are so disposed as to allow the gases to pass from the various cylinders on their exhaust strokes to the interior and exhaust chamber. The rotating mem- 50 ber is operated from any suitable working part of the engine and is preferably held from longitudinal movement by screwed caps and washers which allow for easy access to the rotating member. 55 It will thus be seen that the inlet chamber is continually flooded with explosive mixture ready to enter the working cylinders at the correct cycle of operation of the engine and that the exhaust 60 chamber is always ready to receive gases from the cylinders. This is a very simple construction of valve whose rotating member can readily be removed, repaired or replaced and the whole device is 65 easily attachable to known constructions of engines by simply removing the upper casing of any particular engine and substituting the improved valve casing which is preferably arranged to fit 70 known designs of engines.

Dated this 26th day of January, 1921.

EDWARD L. GEORGE,
Registered Patent Agent,
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7, Elderberry Road, London, S.E. 9,
Agent for the Applicants.

[Price 1/-]

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COMPLETE SPECIFICATION.

Improvements in and relating to Valves for Internal Combustion Engines.

We, FREDERICK SHIRLEY, of 63, Edgware Road, London, W. 2, a citizen of the United States of America, and JOHN WILLIAM GEORGE, of 5, Victoria Terrace, Tottenham Lane, in the County of London, subject of the King of Great Britain and Ireland, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to valves for internal combustion engines of the type in which a rotating cylindrical valve member is arranged above the working cylinders and contains a rotating cylindrical inlet valve chamber and a centrally arranged tubular exhaust valve chamber, the rotating cylindrical inlet valve chamber being continually charged with explosive mixture. Both the rotating cylindrical inlet valve chamber and the central tubular exhaust valve chamber are provided with ports connecting them periodically with the respective working cylinders; the rotating cylindrical valve chamber and its ports acting as the means for supplying the explosive mixture to the working cylinders while the central tubular exhaust valve chamber and its ports serve to receive the exhaust gases. In some constructions of such apparatus it has been proposed to form the suitably waterjacketed and lubricated cylinder head detachable from the working cylinders and to place inlet and exhaust valves of the beforementioned type within such detachable head while in other constructions vanes or blades are formed on an annular rotating inlet valve member so as to produce a fanlike induction action. This annular rotating valve member is interposed between the fixed outer and inner valve cylinders; the inner valve cylinder containing the exhaust passages being secured from movement by suitably disposed bolts by which it is secured to the outer fixed cylinder casing. The present invention consists in providing a self-contained detachable valve mechanism combining the features of the type of cylindrical valve member described above together with fanlike vanes on the induction valve ports and having both inlet

and exhaust passages formed in the rotating valve member; the whole or such mechanism being suitably encased within a waterjacketed casting of a size adapted to fit any known form of standard make of engine.

Referring to the accompanying drawings:—

Fig. 1 is longitudinal view of the improved valve, the outer casing being in section.

Fig. 2 is a cross-sectional view thereof.

Fig. 3 is a plan view of the valve, and

Fig. 4 is an enlarged detail view showing the vanes controlling the inlet ports.

The casing *a* of the valve is provided with inlets *a*¹ for lubrication and contains a rotating cylindrical valve member *c* and is also suitably waterjacketed at *b*. The said rotating cylindrical valve member *c* contains a rotating cylindrical inlet valve chamber *e* and a central tubular exhaust valve chamber *f* communicating with the pipe *g*. The rotating cylindrical inlet valve chamber *e* communicates with ports in the working cylinders *i* of the engine through ports *h* in the rotating cylindrical valve member *c* and the central tubular exhaust valve chamber *f* communicates with the ports in the working cylinders *i* of the engine through ports *j* in the rotating cylindrical valve member *c*. The explosive mixture is admitted to the rotating cylindrical inlet valve chamber *e* from the pipe *d* through induction valve ports arranged midway in the length of the rotating cylindrical valve member *c*. These ports are shaped, as shown in cross-section at *e*¹ Fig. 4, so as to give a fan like induction action to the explosive mixture. The rotating member *c* is operated from any suitable working part of the engine and is preferably held from longitudinal movement by screwed caps *k* and washers *l* which allow for easy access to the rotating sleeve. To understand the operation of the arrangement of valve as shown it is assumed that the rotating cylindrical valve member *c* is operating in clockwise direction, if viewed from the right hand end of Fig. 1; the sequence being in the order of cylinders 1, 2, 4, 3. This is a very simple construction of

- valve whose rotating member can readily be removed, repaired or replaced and the whole device is easily attachable to known constructions of engines by simply removing the upper casting of any particular engine and substituting the improved valve casing which is preferably arranged to fit known designs of engines.
- 10 Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—
- 15 1. An improved valve for internal combustion engines of the type described and having in combination, a detachable casing forming the heads of the cylinders, a rotating cylindrical valve member, a rotating cylindrical inlet valve chamber within said rotating cylindrical valve member, a central tubular exhaust valve chamber within said rotating cylindrical valve member and rotating therewith, fanlike vanes on the induction valve ports, means for retaining the rotating cylindrical valve member from longitudinal movement and means for supplying the explosive mixture to the rotating cylindrical inlet valve chamber and

means for receiving the exhaust from the central tubular exhaust valve chamber substantially as described.

2. In an improved valve for internal combustion engines as claimed in Claim 1, the provision of an outer water-jacketed casing for attachment to any suitable and known form of engine, of a rotating cylindrical valve member held from longitudinal movement by screwed caps and washers and containing inlet and exhaust ports for communication from the working cylinders of the engine to the rotating cylindrical inlet valve chamber and central tubular exhaust valve chamber, of an exhaust pipe from the central tubular exhaust valve chamber and an inlet pipe to the rotating cylindrical inlet valve chamber substantially as described.

3. The improved valve for internal combustion engines, constructed and arranged, substantially as described with reference to the accompanying drawings.

Dated this 21st day of March, 1922.

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Fig. 1.

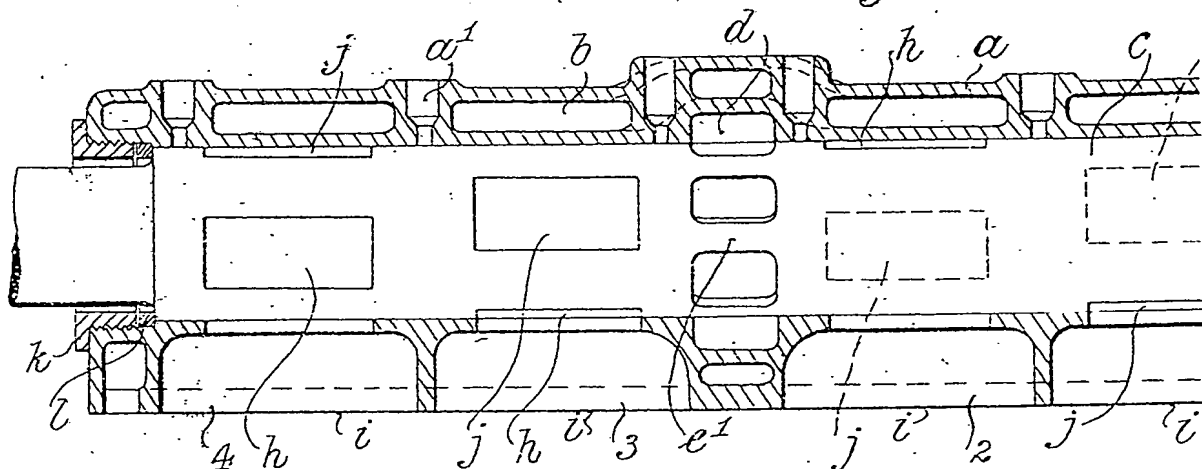
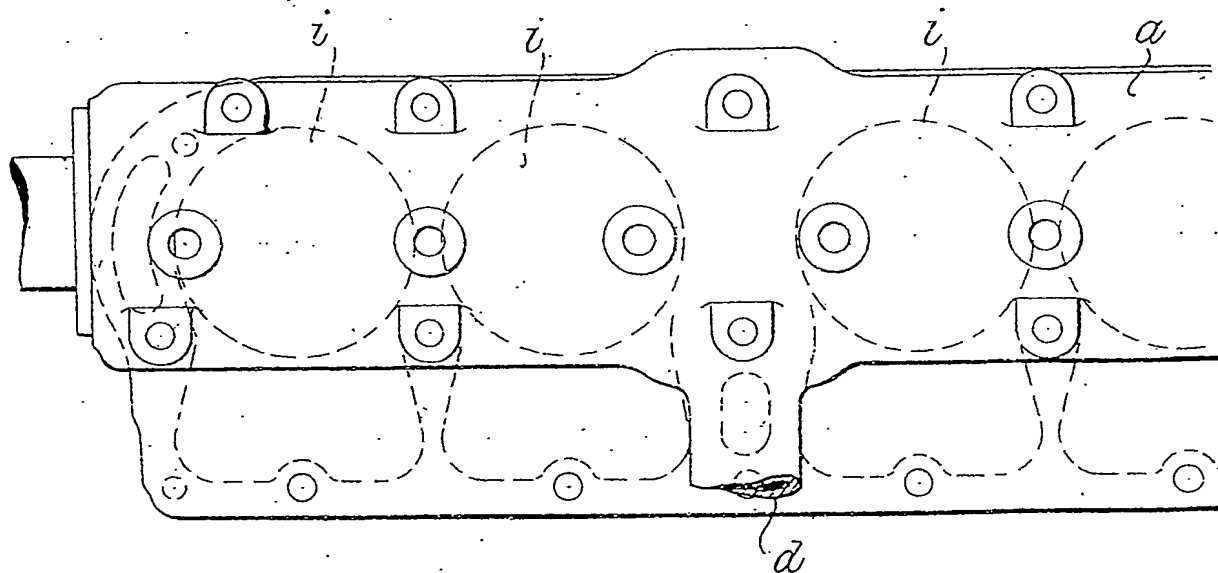


Fig. 3.



[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

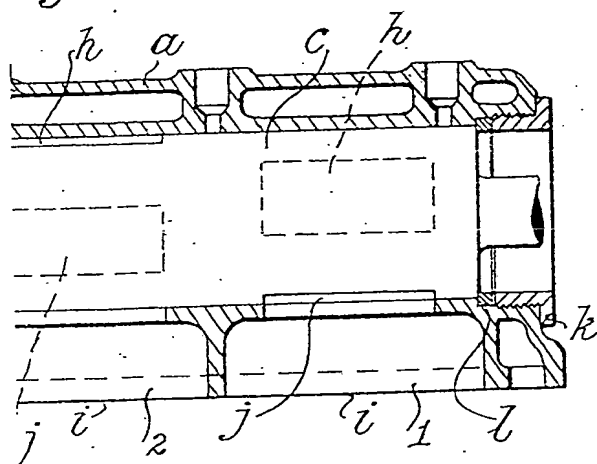


Fig. 2.

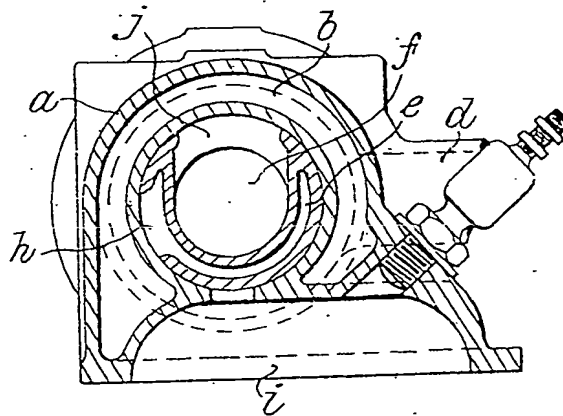
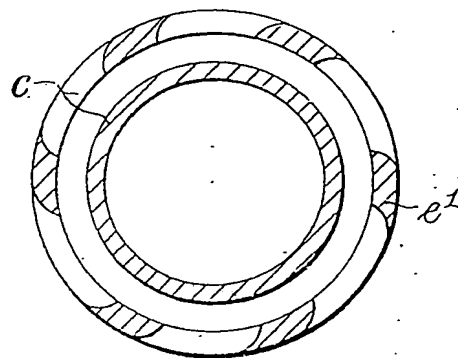
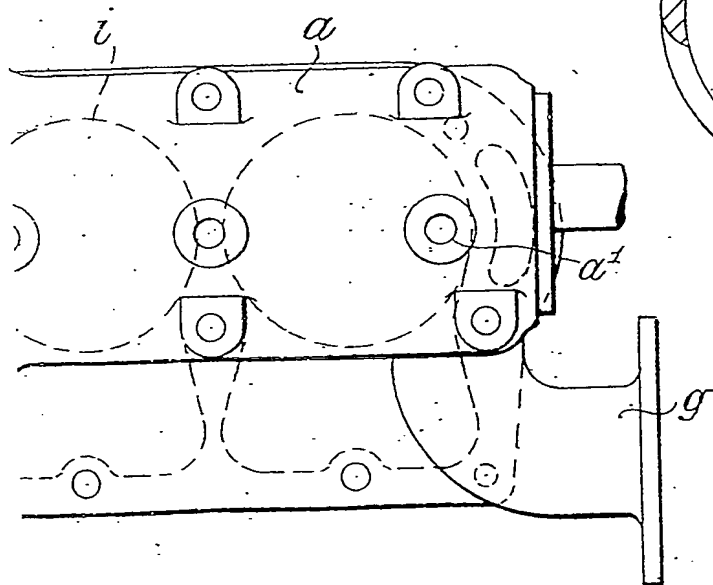


Fig. 4.



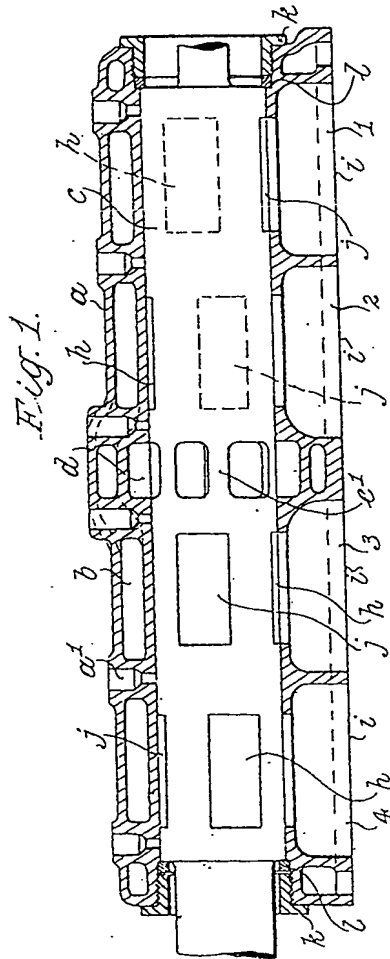
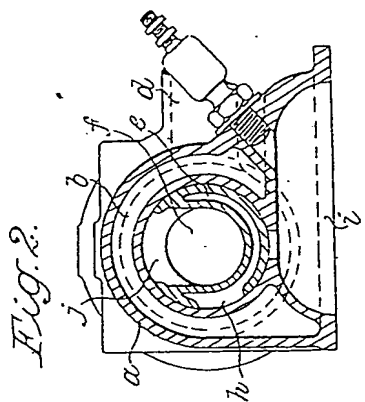


Fig. 4.

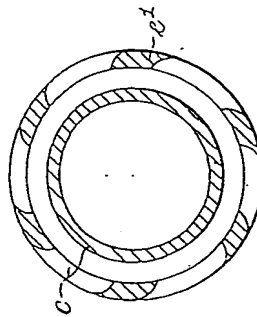
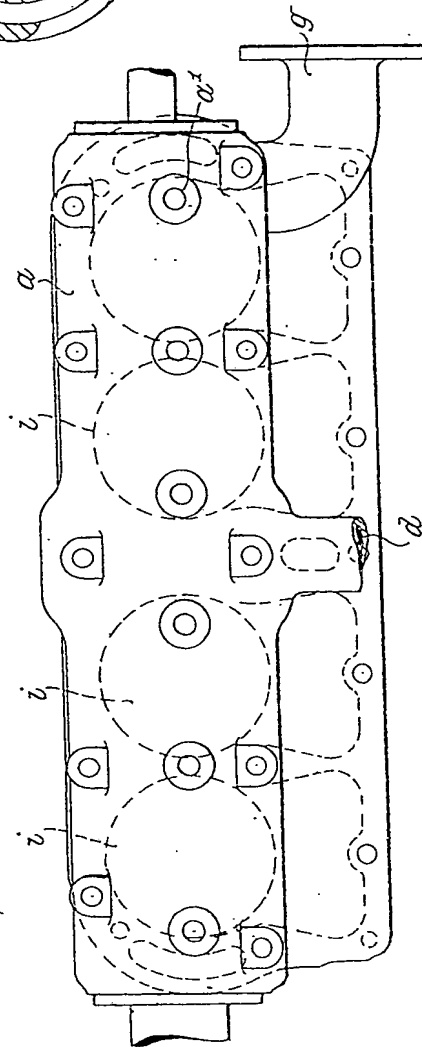


Fig. 3.



[This Drawing is a reproduction of the Original on a reduced scale]